

CHAPTER SIX: STEP 1 - IDENTIFYING PROBLEMS AND OPPORTUNITIES

Would you tell me, please, which way I ought to walk from here?" "That depends a good deal on where you want to get to," said the Cat. "I don't much care where --" said Alice. "Then it doesn't matter which way you walk," said the Cat. From Lewis Carroll's *Alice's Adventures in Wonderland*.

Step One: "Specification of the water and related land resources problems and opportunities (relevant to the planning setting) associated with the Federal objective and State and local concerns." (P&G Standards, Section III paragraph 1.3.2 (a)(1))

INTRODUCTION

As the conversation between Alice and the Cat points out, if you don't know where you're going, it doesn't matter which way you go. In water resource planning it is essential that planners have a sense of the direction in which they want to head. That sense of direction is obtained in the first step of the planning process.

Historically the nation's goals and objectives in water resource planning and development have reflected national values. These national values have evolved and changed over our two centuries as a nation as new problems, challenges and opportunities have emerged. Water resource projects have been planned and implemented to solve those problems, meet those challenges, and seize those opportunities. If they did not, they would serve no purpose.

Without a clear statement of the problems to be solved or the opportunities to be seized, there is no rationale, no reason for planning. As the first step, identification and specification of the problems and opportunities to be addressed is the most important step in the planning process that follows. This first step produces what is essentially the mission statement of the Federal/non-Federal partnership. It is an enduring statement of purpose that distinguishes this partnership from all others.

The identification of problems and opportunities ensures unanimity of purpose within the partnership. Solving these problems and taking advantage of these opportunities provides a basis for motivating and allocating the partners' pooled resources. This step provides a focal point for all stakeholders in the planning process. It says, "This is why we are undertaking this study."

Two Sheets of Paper

Every planning study, from the multi-million dollar multiple purpose study to the several thousand dollar military study and everything in between, should produce two sheets of paper early in the study. One of them lists the problems and opportunities, the other the planning objectives and constraints. The first sheet says this is what is wrong here, the second says this is what we intend to do about it. Together, these two sheets of paper make the most informative summary of your study's purpose that is possible.

Identifying problems and opportunities facilitates translation of the partnership's purposes into appropriate planning objectives. The concerns of both the Federal and non-Federal partners are identified in this step. Ultimately, plans to meet these objectives will be produced. The culmination of the planning process depends critically on the success of this first step.

There are five basic concepts in this chapter: **problems, opportunities, goals, objectives, and constraints.** Understanding these concepts is critical to the success of the planning process.

PROBLEMS AND OPPORTUNITIES

Webster's *New Collegiate Dictionary* defines a problem as a question raised for inquiry, consideration, or solution; or an intricate unsettled question, a source of perplexity or vexation. We can think of it as an undesirable condition. Not everything is a problem and problem solving is only part of the planning story. The other part of the story are the opportunities. Webster defines an opportunity to be a favorable juncture of circumstances; a good chance for advancement or progress. Water resource projects often provide those chances.

Problems and opportunities are conditions that exist in every community. They are the first things you seek to identify in step one of the planning process. Through this first step in the planning process, some problems and opportunities will evolve into planning objectives.

In practice, opportunities are sometimes treated as less important than problems in the planning process. Capitalizing on opportunities, however, is every bit as important as solving problems.

Is there really a difference between a problem and an opportunity? That depends. In many cases it may come down to whether you see the glass of water as half empty or half full. In general, problems tend to be both negative and current conditions. Something *is* broken, something *is* missing, and the like. Opportunities tend to focus on positive and future conditions. Something *can be* made better. Other ways to think about the differences between problems and opportunities are suggested in Table 14. If problems differ from opportunities in some ways, they are similar in others. Some similarities are presented in Table 15. There are no absolutes in these comparisons. The rule of thumb is to be flexible in defining problems and opportunities.

Table 14: Differences Between Problems and Opportunities

<u>Characteristic</u>	<u>Problem</u>	<u>Opportunity</u>
FOCUS	Existing undesirable condition; Description of what is.	Future desirable condition; description of what could or should be.
MESSAGE	Negative; objection.	Positive; desire.
OCCURRENCE	<ul style="list-style-type: none"> • Past - Usually occurred • Existing - Usually occurs. • Future “without” - Usually expected to occur. 	<ul style="list-style-type: none"> • Past - Usually didn’t occur. • Existing - May or may not occur. • Future “without” - May or may not be expected to occur.
RELATIONSHIP TO OTHER RESOURCES	<ul style="list-style-type: none"> • Existing condition may adversely affect other resources • Survival may be an issue. 	<ul style="list-style-type: none"> • Existing condition does not affect other resources. • Survival not an issue.
IMPLICIT OBJECTIVES OF ACTION	<ul style="list-style-type: none"> • Return to a past condition that was not considered objectionable (example: restore a degraded habitat). • Create a future condition that would not be objectionable (example: stabilize an eroding shoreline). 	<ul style="list-style-type: none"> • Create a future condition considered to be desirable (example: develop new wetlands). • Return to a previous condition considered to be desirable (example: rehabilitate an historic structure).
CONSEQUENCES OF DOING NOTHING	Usually direct, immediate, and adverse.	Usually indirect and long-term due to benefits foregone.

Problem definition is the detailed description of a problem. It begins with a **problem statement**; a simple, usually one sentence, assertion of what the basic problem is. Pick up any Corps planning study and you'll find a section entitled “Problems and Opportunities.” Read it, and you'll usually have a good idea what problems the study is going to address. It is rare, however, to find a clear and concise statement of these problems. It is far more common to find a problem described and defined in a piecemeal fashion over several paragraphs of text than it is to find a direct statement of a problem, like “The problem is loss of coastal wetlands along Utopian Point.” It may require many paragraphs to properly characterize the nature, cause, location, dimensions, origin, and importance of this problem, but it is important to be able to clearly state it. *If a planner can't finish the sentence, “The problem is . . .” clearly and concisely, then nothing else that follows in the study is likely to be very clear either.* Every study should include a problem statement.

Problem definition can be expanded to identify the nature, cause, location, dimensions, origin, time frame, and importance of the problem, as well as an indication of who considers this a problem. An opportunity can be defined the same way. A

Table 15: Similarities Among Problems and Opportunities

<u>Characteristic</u>	<u>Similarity</u>
NUMBER	Variable; few to many.
HOW STATED	In practical, meaningful, operational terms in a single statement.
SOURCE	Developed; from people, observation, analysis, and documentation.
SPECIFICITY	Specific; narrow; essentially limited.
SPECIFIC SUBJECT	Usually limited to a specific resource.
SPECIFIC LOCATION	Usually found in a particular place or locale (example: "study area").
SPECIFIC MEASURABILITY	Moderate to high; usually measurable or easy to recognize change that would result in a "better" or "worse" condition.
ABILITY TO ACHIEVE	High; problems can be solved, opportunities can be realized.
"IDEAL"	<ul style="list-style-type: none">• An "ideal" usually exists and can be identified.• The "ideal" is not the same as the existing condition.• The "ideal" is not the same as the long-term "without" condition.

detailed profile outline that may be handy to use in thinking about and describing your study's problems and opportunities can be found in the sidebar.

An important aspect of problem definition is describing its cause. If the underlying causes of a problem are not identified, the solutions can end up being superficial and unsuccessful. People usually complain about problem conditions long before the underlying causes are known. People know the fish are disappearing from a creek long before they know why. The solutions to the problem can vary considerably depending on whether the cause is overfishing, loss of habitat, disease, or declining water quality due to increasing urbanization.

A Simple Problem Statement

A problem statement need not be elaborate. It can be as simple as the following example.

Franklin Creek Basin Problem Statement

The problems in the Franklin Creek Basin are:

- 1) Loss of fish habitat in Franklin Creek due to urbanization;
- 2) Flood damages in the industrial section of Central City;
- 3) Streambank erosion along Campus Park;
- 4) Saltwater intrusion in the Franklin Bay estuary;
- 5) Loss of coastal wetlands along the South Ditch section of Franklin Bay.

The definition of these problems will take considerably more

. There are criteria that characterize good and bad statements of problems and opportunities. For example, good problem statements never include solutions or the suggestion of a specific solution. “The problem is we don't have a floodwall” is not a good problem statement. As a matter of fact, it skips the entire planning process and jumps to the selected plan. All the planner has to do is figure out the details; where the wall should go, how high should it be, and so on. The problem is not that someone does not have a floodwall. The problem may be that the watershed is developing without thought being given to the effects on runoff and streamflow, thus expanding the flood plain and exacerbating floods. The problem may be unrestrained development of the flood plain itself. The problem may be the catastrophic damages

A Simple Opportunity Statement

An opportunity statement need not be elaborate. It can be as simple as the following example.

Franklin Creek Basin Opportunity Statement

There are opportunities in the Franklin Creek Basin to:

- 1) Increase wildlife habitat along Campus Park.
- 2) Restore indigenous fish species in the upper basin.
- 3) Provide increased recreational opportunities along the waterfront.

that occur with infrequent flooding. Or, it could be the minor nuisance associated with frequent floods. The problem is not what the customer wants but doesn't have. The problem is usually far more complex than that.

Problem/Opportunity Profile

1. Source. What source first identified the problem or opportunity?
Examples: study authority, local master plan, conversation with city mayor, Corps experts based on field observations.
2. Public Concerns
 - a. Advocate - Who is the spokesperson for the problem or opportunity? Identify specific groups, agencies, and individuals.
 - b. Basis - What is the advocate's basis for the problem or opportunity? Examples: homeowners who have experienced flooding, state agency legally mandated to oversee wildlife resources.
 - c. Background - In the advocate's view, what is the problem or opportunity, and what are the causes and effects?
 - d. Other Stakeholders - Who else believes the problem or opportunity does or does not exist? Why or why not? Identify specific groups, agencies, and individuals.
3. Technical Analysis
 - a. Subject - Describe the subject of the problem or opportunity.
 - b. Location - Describe the location of the problem or opportunity; map it if possible.
 - c. Measurement - Identify one (or more) measurable indicator that is used to measure change in the problem or opportunity.
 - d. Conditions - Describe past, present and future conditions related to the problem or opportunity:
 - (I) Historic condition
 - (ii) Existing condition
 - (iii) Future "without project" condition
 - e. Decision Criteria - Identify any standard, target or other criteria that may be used to define the magnitude of a problem or opportunity. For example: state water quality standards, design vessel dimensions, and so on.

*Plans are formulated to achieve **planning objectives**. Planning objectives and constraints are inexorably linked to problems and opportunities. Thus, clearly articulated problem and opportunity statements are essential to the success of any*

*planning process. **Planning objectives provide a clear statement of the purpose of a study.** There is no study without planning objectives and there are no objectives without carefully defined problems and opportunities. These simple facts and this simple linkage between problems and objectives make this step the most important in the planning process.*

What's the Problem?

When you read a planning report, you should be able to deduce the problem and opportunity statements from a good set of planning objectives and constraints. The linkage between “problems and opportunities” and “objectives and constraints” is a critical one. See if you get a feel for the problems to which these objectives refer:

- Increase habitat heterogeneity.
- Reduce flood damages on Seminole and Miccosukee tribal lands.

GOALS AND OBJECTIVES

To understand planning objectives and constraints, we return to the basic concepts of this planning step. In a perfect world, the logical sequence for encountering these ideas over the life of a planning study is:

- *Goals*, which are given to us; followed by
 - *Problems and opportunities*, which we identify; followed by
 - *Objectives and constraints*, which we base on the problems and opportunities.

Will we always encounter them in this order? Probably not. But by the time a final plan is selected, we will have struggled with each, and it is important to understand their individual and complementary roles in getting us to a selected plan.

One thing these five concepts have in common is that each can and should be expressed in a simple and clear statement - a sentence. It may require paragraphs, pages, or volumes of backup documentation to fully explain their various technical dimensions, complexities, interrelationships, public opinions, and other factors; but they must also exist as short summary statements that can be read and understood by everyone with a stake in the outcome.

Problems and opportunities have already been defined. Now we backtrack a little to consider goals and objectives. A subsequent section will take up a comparison of objectives and constraints.

Webster's New Universal Unabridged Dictionary defines a goal as the end or final purpose. An objective is defined as something aimed at or striven for. Both convey the same basic intent; in short, “do good.” And the definitions establish a hierarchical structure that suggests we set goals first then establish objectives that will help us attain our goals. A goal says “do good broadly;” an objective says “do good specifically.” Other ways to think about similarities and differences between goals and objectives are suggested in Table 16.

GOALS AND OBJECTIVES ILLUSTRATED

An example can help define these terms. Let's say that you and some friends agree that you should all be happy. Your common goal is “happiness.” Everyone will individually define what “happiness” means for themselves. These individual statements will be their personal objectives to achieve “happiness.” Perhaps the results look like this:

- Goal: Happiness
- Your Objectives:
 - Go on vacation next month.
 - Get a promotion.
 - Finish reading the Planning Manual.
- Friend 1's Objectives:
 - Double my salary.
 - Spend more time with my family.
- Friend 2's Objectives:
 - Get a motorcycle.
 - Go camping this summer.
 - Lose 10 pounds.

The group has a common goal. Some individuals' objectives are similar and others differ among the group. Collectively, they are all consistent with the message of the goal. The objectives follow from the goal. With this simple framework in mind, we can understand the relationship between the NED Federal objective and planning objectives. It begins with another important distinction between goals and objectives.

Table 16: Goals and Objectives

<u>Characteristic</u>	<u>Goal</u>	<u>Objective</u>
NUMBER	Few in any given study.	Variable; few to many.
HOW STARTED	In idealistic terms.	In practical, meaningful, operational terms.
SOURCE	Given.	Developed from problems and opportunities
SPECIFICITY	General; broad; conceptual; Essentially unlimited.	Specific; narrow; essentially limited.
SPECIFICITY: SUBJECT	Covers a wide variety of subjects, resources, or issues.	Usually limited to a single subject, resource, or issue.
SPECIFICITY: DURATION	Timeless; undated; intended for to the long-term.	Dated; time-phased; can or intended to be achieved within a particular time frame.
SPECIFICITY: LOCATION	Applicable to large areas; international, national, or regional.	Applicable to a particular place or locale ("study area"); regional or local.
SPECIFICITY: MEASURABILITY	Moderate to low; not necessarily measurable measurable or easy to recognize achievement.	Moderate to high; usually or easy to recognize achievement.
ACCEPTABILITY	High; generally acceptable to all; Agreement.	Low to high; may be conflicts; Consensus may be lacking.
CHANGEABILITY	None (in the near-term) to low; stable.	Variable; low to high.
ABILITY TO ACHIEVE	Low to moderate; not realistic to expect one solution to fully achieve all aspects.	High; can be achieved, in whole or part, by a single solution.
MESSAGE	Do good ("motherhood and apple pie") and do not do bad ("Thou shalt not...").	Do good.

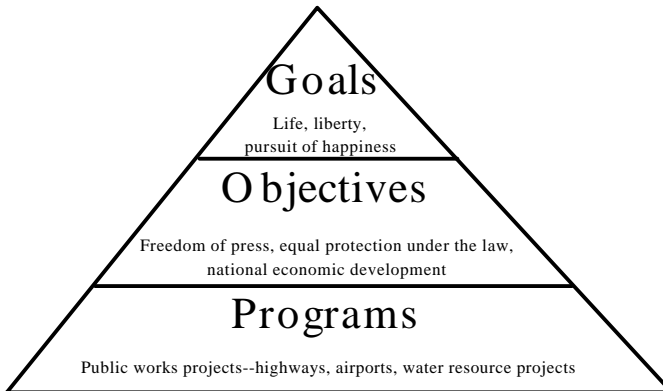
FEDERAL GOALS AND OBJECTIVES

Suppose for the sake of simplicity that we take “life, liberty, and the pursuit of happiness” as some of our nation's goals. These are ultimate destinations for the citizens of this country, and provide a broad and enduring direction for the nation's government. The goal statements do not suggest a way to achieve these goals, however.

Further suppose that freedom of the press, equal protection under the law, and economic development are some of the objectives that could help us attain our national goals. Now, suppose national economic development (NED) can be achieved through a variety of missions and programs of various Federal government agencies, like monetary policy, job training, education, and public works projects. In turn, public works projects could consist of highways, airports, and water resource projects.

At the national level we have described the hierarchy shown in Figure 5. From the perspective of the President, the Congress, and the general populace of the United States, *our national goals - life, liberty, pursuit of happiness, and others - are further defined through a complex set of national objectives, such as national economic development, that flow from and support the intent of the goals.* Thus, we have national economic development as a true national, or “Federal,” objective.

Figure 5: National Goals and Objectives



Beware. Perspectives change. What is a goal and what is an objective change when you move from the national level to your local planning level. *The Federal objective becomes a goal for Corps' planners in each of their planning studies.*

PLANNING GOALS AND OBJECTIVES

Because this is an instructional manual, let's not worry about the goals and objectives of the Corps or its planning partners for now. Instead let's think about a specific planning partnership, i.e., a specific study. Where do the planning goals come from? Generally, the planning goals are the objectives of some organization higher up in the hierarchy. For example, the P&G make it clear that national economic development is the Federal objective. National economic development, from the Federal perspective, is the primary purpose of a water resource project. It is not something that water resources projects try to do a little of, it is the entire reason the Federal government is involved in water resource development in the first place. Plans are not formulated specifically for national economic development; that is understood to be the reason for the program's existence.

The Federal NED objective is a goal for the planning partnership. One of the planning team's first responsibilities is to develop planning objectives that will help the partnership contribute to that goal.

There can be other goals as well. Goals are the broad, over-arching purposes for a study. They may be defined by the non-Federal partner or any other stakeholder, and will be unique to each study. In Corps' planning under the requirements of the P&G, the NED goal ("Federal objective") is always a given that you will start with.

Thus, for a planning partnership, Federal and non-Federal objectives become planning goals. One person's objective is another person's goal. The objectives of the organizations higher in the hierarchy become the goals of the planning partnership. The planning partners must then develop planning objectives to help attain these goals. Although the terminology may seem confusing, do not be confused about their roles in doing planning. *Goals will be given to you; you will develop objectives.*

PLANNING OBJECTIVES AND CONSTRAINTS

An objective is a statement of the intended purposes of the planning process; it is a statement of what an alternative plan should try to achieve. More specific than goals, a set of objectives will effectively constitute the mission statement of the Federal/non-Federal planning partnership.

Our planning partnerships exist in a world of scarcity where it is not possible to do everything. Our choices are constrained by a number of factors. Planning is no exception. An essential element of any planning study is the set of constraints confronting the planners. *A constraint is basically a restriction that limits the extent of the planning process.* Constraints, like objectives, are unique to each planning study.

Two distinctly different categories of constraints can be identified. First, there are **resource constraints** on the planning process. These include limits to our

knowledge, expertise, experience, ability, data, information, money, and time. These constraints limit the scope of a study in significant ways. Resource constraints are considered again in Chapter Twelve. Here we need to focus on a second category of constraints - **planning constraints** that restrict plan formulation. These can be divided into **universal constraints** and **study-specific constraints**.

Universal planning constraints are the legal and policy constraints that need to be included in every planning study. They may vary from study type to study type, but for a given type of study, there are some predictable constraints. For example, you don't formulate plans that intentionally adversely affect threatened or endangered species. The Corps of Engineers will not formulate flood damage reduction plans for streams where the 10 percent discharge is less than 800 cubic feet per second. The Corps' guidance, regulations, policies, and authorities define some of these constraints. Others are defined by the laws and regulations of the Federal government and the applicable laws and regulations of the State and local governments.

Study-specific planning constraints are statements of things unique to a specific planning study that alternative plans should avoid. While universal constraints are applicable from one study to another, study-specific constraints are not. Examples of study-specific constraints include the following:

- Do not induce salinity intrusion into freshwater aquifers.
- No loss of flood protection from an existing levee system.
- No increase in shoreline erosion related to navigation.

The significance of both types of constraints is that they can limit choices. The presumption is that constraints limit choices in socially desirable ways.

Planning objectives are the things we want to accomplish with a plan. They are the desired changes between the without- and with-project conditions. *In contrast, study specific planning constraints are things we want to avoid doing.* Constraints are designed to avoid undesirable changes between without- and with-plan conditions. They are things we don't want to “mess up” with our plans.

While plans are formulated to achieve planning objectives they are also formulated to avoid violating the constraints. The simplest difference between the two concepts can be summarized as follows: Objective--do good; Constraint--don't do bad. Some other similarities and differences between objectives and constraints are suggested in Tables 17 and 18.

Table 17: Similarities Between Objectives and Constraints

<u>Characteristic</u>	<u>Similarities</u>
NUMBER	Variable; few to many.
HOW STATED	In practical, meaningful, operational terms and in a single statement.
SPECIFICITY	Specific; narrow; essentially limited.
SPECIFICITY: SUBJECT	Usually limited to a single subject, resource, or issue.
SPECIFICITY: MEASURABILITY	Moderate to high; usually measurable or easy to recognize achievement.
ACCEPTABILITY	Low to high; may be conflicts; consensus may be lacking.
CHANGEABILITY	Variable; low to high.
ABILITY TO ACHIEVE	High; can be achieved, in whole or part, by a single solution.

Planning objectives and constraints are indications of what is important to people. Planning by objectives, i.e., formulating plans to meet valid social, environmental, economic, and engineering objectives and to avoid undesirable consequences, is what the planning team is supposed to do. This is very different from planning to maximize NED benefits. When specifying planning objectives and constraints is an exercise to be checked off a planning team's "to do" list, we see the latter form of planning.

The planning objectives and constraints are in reality a statement of the reasons for the planning effort. The objectives and constraints should reflect the views of the public regarding the problems and opportunities of the planning area. They are a list of results that are desired from a project. The planning objectives and constraints are the reason for the Federal/non-Federal partnership. They are, in a sense, the partners' mission statement - that enduring statement of purpose that distinguishes this partnership from all others. Plans are formulated to meet the planning objectives and to avoid the constraints; there can be no other reason for a plan.

PROFILE FOR AN OBJECTIVE OR CONSTRAINT

Objectives, as well as constraints, are written statements -- simple sentences -- that should generally include the following four types of information: **effect**, **subject**, **location**, and **timing** and **duration**. The detailed profile in the sidebar can be helpful in developing objectives and constraints.

Table 18: Differences Between Objectives and Constraints

<u>Characteristic</u>	<u>Objective</u>	<u>Constraint</u>
SOURCE	Developed from problems and opportunities.	Given (example: some legal design constraints); or developed based on area-specific conditions (i.e., public views, resource limitations).
SPECIFICITY: DURATION	Dated; time-phased; can be or are intended to be achieved within a particular time frame.	Variable; may be dated and time-phased, or intended for the long-term.
SPECIFICITY: LOCATION	Applicable to a particular place or locale ("study area"); regional or local.	Variable, depending on the subject being constrained.
MESSAGE	Do good.	Don't do bad.

The effect is the verb part of the statement that expresses the intent to “do good” in an objective and “don’t do bad” in a constraint. It describes the type of effect that alternative plans should cause. Table 19 lists some verbs commonly used in objectives and constraints. Many of them have specific regulatory meanings and in certain situations carry policy implications, i.e., cost sharing for “mitigation” or “restoration.” Others might invoke personal biases. Exercise caution and care in choosing and using these terms or others.

Table 19: Objective & Constraint Verbs

abate	preserve
advance	prevent
avoid	produce
compensate for	prohibit
conserve	promote
contribute to	protect
control	provide
create	reclaim
destroy	reconstruct
develop	recover
eliminate	recreate
enforce	rectify
enhance	reduce
establish	rehabilitate
exchange	repair
harmonize	replace
improve	restore
maintain	retire
manage	stabilize
minimize	substitute
mitigate	

The subject part of the statement tells us what is to be changed for the better through meeting the objective, or not changed through avoiding a constraint. This part of the statement is the link to a problem or opportunity. It captures the problem or opportunity in a phrase.

The location defines where the objective is to be achieved, or where the constraint is to be avoided. It is often the planning area.

Time and duration define when and for how long the objective is to be achieved or the constraint is to be avoided. Oftentimes, “timing and duration” will be the “period of analysis” and it will be the same for the study’s objectives and constraints. Such similar conditions don’t have to be repeated in each statement, but could be described once as applicable to all the objectives and constraints.

CHARACTERISTICS OF GOOD OBJECTIVES AND CONSTRAINTS

There are few hard and fast universal rules that must apply to all objectives. However, the following characteristics that apply generally to both objectives and constraints are helpful to keep in mind.

Specific. Specific objectives provide useful guidance for plan formulation. *The more specific the objective, the easier it is to identify measures or to formulate plans necessary for attaining it.* Non-specific objectives cannot be effectively pursued or attained and are to be avoided. “Improve the environment” is a non-specific objective that does little to aid planners or decision-makers. “Increase tidal wetlands in the King River vicinity” is specific enough to guide planners in the formulation process.

Objective/Constraint Profile

1. **Problem/Opportunity Statement.** Provide a clear and brief description of the problem or opportunity that is the basis for the objective/constraint.
2. **Analysis.**
 - a. **Effect** - Describe the type of effect to be achieved. This is the objective's/constraint's "verb".
 - b. **Subject** - Describe what is to be changed by meeting the objective, or not changed by meeting the constraint. This is the objective's/constraint's "subject".
 - c. **Location** - Describe the location where the objective is to be achieved, or the constraint is to be avoided.
 - d. **Timing and Duration** - Describe when and for how long the objective is to be achieved or the constraint is to be avoided.
 - e. **Measurement**
 - (i) **Output** - Identify one (or more) indicator that will be used to measure change. For each indicator, identify one (or more):
 - (1) **Measurement Unit** - Identify the unit to be used to measure change.
 - (2) **Measurement Technique** - Identify the procedure that will be used to measure change in the specified unit.
 - (ii) **Thresholds** - If applicable, identify output thresholds:
 - (1) **Minimum** - Is there a minimum level of output, such that amounts of output less than the minimum are not useful, are not reasonable, or otherwise don't make sense?
 - (2) **Maximum** - Is there a maximum level of output, such that amounts of output greater than the maximum are not useful, are not reasonable, or otherwise don't make sense?
 - f. **Decision Criteria** - Identify any standard, target or other criteria that will be used to judge how well or poorly the objective/constraint would be achieved. Identify the source (law, regulation, master plan, etc.), responsible entity (agency, organization, etc.), penalties for noncompliance, and other characteristics of each decision criterion.
 - g. **Sponsor** - Identify an objective's "sponsor" - what entity would potentially share the cost of a solution that would achieve the objective? Identify a constraint's proponent.
 - h. **Other Stakeholders** - List any other stakeholders in the objective/constraint - what other entities have an interest in seeing that the objective/constraint is achieved or not achieved? Briefly describe the nature of each stakeholder's interest.
 - I. **Sources of Information** - List sources of information about the objective/constraint and its characteristics.
 - j. **Studies needed** - Briefly describe the types of additional studies needed in further planning for the objective/constraint.
3. **Statement.** State the objective or constraint.
4. **Potential Solutions.** List any potential solutions that may meet, at some level, the objective or constraint.

Flexible. Objectives should be flexible enough to accommodate alternative ways for achieving them as well as to allow alternative levels of results. “Build a floodwall that provides 100-year protection” is the worst kind of objective. First, it states a solution rather than focusing on a problem or opportunity, thereby eliminating any flexibility in choice of measures to reduce flood damages. Second, it does not allow for any flexibility in determining the level of flood damage reduction. Planners must be cautioned that flexibility in objectives may come at the expense of specificity and the relative merits of the two must be assessed by the planner in light of customer feedback.

Measurable. A good, specific objective can also be measured. To be measurable an objective must be stated in terms that can be assessed or quantified. Though it is not necessarily always desirable for the objective to specify the actual measure, the objective should be measurable in some appropriate units. An exception is where there are thresholds or legal mandates that make specific levels of output necessary. An objective to “Enhance community cohesion” is not easily measured, but “Increase the number of protected structures” gets at the same objective in a measurable manner.

A measurable objective is useful to decision-making. If we can measure a plan's contribution to increasing open space we can more easily evaluate its value. Measurability allows us to observe exactly what a plan contributes.

Attainable. *Objectives should provide a challenge to planners, but they must also be realistic and attainable.* “Restoring the Minnow Creek ecosystem to its natural condition” is an admirable objective that may be popular with the public, but it is not realistic in an urban environment, hence it cannot be attained. “Increasing dissolved oxygen in Minnow Creek” is a more attainable objective. Unattainable objectives may do little more than frustrate people because they are unable to meet them. Once such a situation arises, it may be very difficult to motivate people. Specificity can often make an objective more attainable.

Congruent. Ideally, objectives will be congruent with each other. Congruency means the objectives fit together. More specifically, attainment of one objective would not preclude the attainment of another. This is not likely to be the case, however, when the problems and opportunities involve any complexity at all. The variety of different and, at times, conflicting viewpoints on the planning area's problems and opportunities virtually assures some incongruencies among objectives.

Incongruent objectives can lead to conflict within the planning process. Conscious or unconscious efforts to minimize conflict by eliminating incongruencies among objectives are to be avoided when the incongruent objectives represent legitimate, conflicting problems and opportunities. Incongruencies should be avoided whenever they add nothing to the planning process. For example, there is no point to specifying the objectives: “decrease flood damages” and “hold flood damages constant.” These conflict for no apparent purpose. On the other hand it may be wholly appropriate to specify the local objectives: “increase open space” and “increase regional tax base.” In this latter case, there may be an incongruity if the former

objective would be served by relocating structures from the flood plain, and the latter is served by developing the flood plain. Different plans can be formulated to meet incongruent objectives. Conflicting objectives provide a good reason for different alternative plans.

Acceptable. Good objectives have to be acceptable to those responsible for achieving them - that is, the planning partners. They must also be acceptable to the partners' customers and major stakeholders. *Not every objective must be acceptable to all stakeholders, but the set of objectives should be acceptable in principle to all study interests.* The acceptability of objectives is founded in their responsiveness to stakeholders' problems and opportunities. There is no better investment in a plan's credibility than paying attention to people's problems and opportunities.

WHAT A GOOD OBJECTIVE IS NOT

Just as the aforementioned qualities will lead to good objectives, the following characteristics are warning flags for objectives and constraints that could lead you astray.

Absolute Target. Though specific, an objective should not specify an absolute target as the only level of the desired result. It needs to be flexible. For example, "Increase tidal wetlands in the King River vicinity by 2,000 acres" is not an appropriate objective. Outputs vary with the nature and size of the alternative plan and are therefore a product of the formulation process. While a target may be useful, or even necessary, in later plan selection, objectives should generally not contain targets.

Solution. As mentioned earlier, objectives should not include solutions, i.e., neither individual management measures, alternative plans, nor programs. If we are to seek optimal solutions that meet as many of the objectives as possible, we cannot begin by ignoring the full range of measures available to us. Objectives should not specify the measures or plans that can be used to meet the objective. Thus, unlike a for-profit business, objectives should not specify a precise level of attainment or a specific means for attaining it.

Federal Objective. National economic development is not a planning objective. The Federal objective specified in the P&G is a goal. This goal, like other goals supported by other study stakeholders, provides the reason for the study rather than a reason to formulate alternative plans. Good objectives are not goals.

Account. The P&G define four categories (or “accounts”) of effects to facilitate evaluation and comparison of alternative plans. They are discussed in more detail in Chapter Nine. One account, national economic development (NED), includes the effects that can be counted in demonstrating progress toward the Federal objective. The other three accounts, environmental quality (EQ), regional economic development (RED), and other social effects (OSE), are neither goals (“Federal objectives”) nor planning objectives. Good objectives are not account entries.

Study tasks and study resource constraints. Study task objectives describe the day-to-day activities that must be accomplished in planning. They are not planning objectives. Similarly, study resource constraints define limits on resources like knowledge, expertise, experience, ability, data, information, money, and time. They are not planning constraints.

WHERE DO OBJECTIVES COME FROM?

There is no one way to identify planning objectives. It’s a task easier prescribed than accomplished. If your method works, it’s a good one. Bearing in mind who does it, why they do it, what a good one is, and so on, there are a few activities that would appear to be a necessary part of any effort to identify objectives. They’re listed in an idealized process outlined in Figure 6.

Good Planning Objectives... or Not?

Which of the following are good planning objectives?

1. Reduce flood damages in the City of Maccaville through the year 2020.
2. Provide a levee to prevent flooding in the City of Maccaville.
3. Contribute to National Economic Development in the City of Maccaville consistent with protecting the Nation's environment.
4. Assess the impacts of a flood control project in the City of Maccaville through the year 2020.
5. Minimize disturbance of riparian habitat used by the endangered Ferocies along the Macca River.

Answers: 1). Yes; 2). No, includes solution; 3). No, this is a goal; 4). No, this is a study task; 5). No, this is a constraint.

Begin at the beginning. What clues does the “study authority” provide about planning objectives? A study authority (see sidebar) usually lists major categories of problems and opportunities, i.e., navigation, flood damage reduction, ecosystem restoration, and others, that are the reasons for the study. The authority also usually includes a short verbal description of the “study area.” Always begin by squeezing the clues from your authority.

Study Authority

In Corps reconnaissance and feasibility planning studies conducted under the general investigations program, a study authority is usually a one-paragraph statement from a committee of the U.S. Congress (i.e., “study resolution”) or the full Congress (i.e., section in a public law) that requests a senior Army or Corps official to investigate a specified problem or opportunity, and report the results back to the Congress. For example:

“Resolved by the Committee on Transportation and Infrastructure of the United States House of Representatives, that the Secretary of the Army is hereby requested to review the report of the Chief of Engineers on the Big Blue River and Tributaries... with a view to determining if further improvements for flood control, navigation, erosion, sedimentation, water quality and other related water resources needs are advisable at this time.”

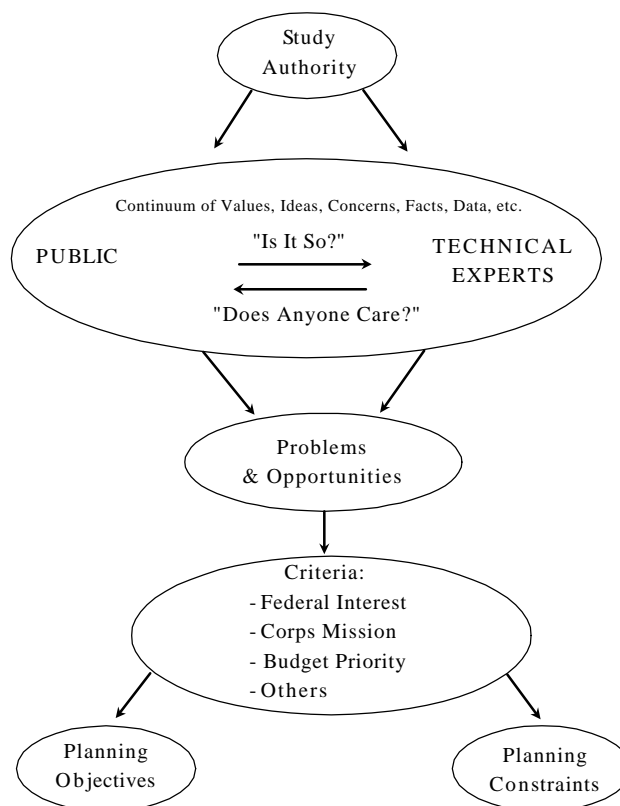
What does this tell you about the study area? What types of problems and opportunities are identified? Notice that the door to other problems and opportunities beyond those explicitly listed is opened through the recognition that there may be “other related water resource needs.”

The next step in identifying objectives and constraints is to ask, “What does the public say?” Given that your study authority points to one or more problems and opportunities, the next step should be to verify them and see whether there are any others. You can do this rather simply. First, ask the public. What are the problems and opportunities they think should be investigated? How do they know about those problems and opportunities; have they experienced them? How would they know if the problems were “solved” or the opportunities “realized”? To whom else should you talk?

Whom in the public should you ask? Ask everyone who may have something to offer. Ask the potential local sponsor. Ask officials and representatives of local, State, and Federal agencies. Ask people in local businesses, interest groups, and homeowners' associations. Ask them in whatever format makes the best sense -- individual conversations, single-interest meetings, open public meetings. The means of asking the public must be tailored to suit each individual planning situation; the point is to ask. See Chapter Thirteen for additional discussion of public involvement.

Frequently the public will only be able to describe their problems and needs in a general form. For example, residents may be capable of defining flooding from a stream as a problem, but the study team will have to do some analysis to determine the extent of the flood plain, the frequency and depths of flooding, the properties affected, and the expected annual damages under existing conditions. *The study team will have to put a technical face on the community's problems and needs.*

Figure 6: Where Objectives and Constraints Come From



The second source of information about problems and opportunities is technical experts. Relying on technical experts is a traditional approach to this step of the planning process. The technical studies conducted to establish the scientific basis for problems and opportunities are generally well known (see sidebar). The resulting descriptions of technical concerns will look much different from the public's concerns. Typically, they are included in great detail in report appendices for hydrology, economics, real estate, and other specialty areas. Where brief statements are usually adequate to convey public concerns, technical concerns often include maps, drawings, tabular and graphic displays of data, and technical text.

Like the general public, experts include people from many backgrounds, including hydrologists, engineers, environmental scientists, economists, and many others. They can refer you to previous studies, identify other experts, and provide their professional judgment about the situation. Your initial contacts will undoubtedly be with the experts on your study team and elsewhere in your District office. Beyond them are experts in other agencies, universities, consulting firms, and the general public. This is where the line between “the public” and “technical experts” blurs but it doesn't

Key Factors

Although the study team actually specifies the planning objectives, they must do so while taking several key factors into account.

- External Environment. The partnership's external environment often exerts considerable influence on the objectives. The external environment comprises all those factors that the partnership cannot control. External stakeholders can influence the planning process by social norms, specific constraints, pressure campaigns, court challenges, direct controls (e.g., resource agencies sometimes have effective veto powers), and so on. Thus, setting planning objectives is, in part, a process of establishing a favorable balance of power between the partnership and its external environmental factors.

- Resource Constraints. The partnership's resources influence the nature of the objectives. Studies hampered by severe time and money constraints will not be able to address as complete a range of objectives. Plans will consequently be less comprehensive in scope. Non-Federal partners who contribute databases and work in-kind may constrain a study from considering a broader range of objectives. Better funded studies can set more objectives.

- Internal Relationships. The partnership's internal politics and power relationships will influence planning objectives. Planning teams with more overall support of the partners can set more ambitious planning objectives. Innovative planning objectives that do not enjoy the support of higher elements on either side of the partnership may have a more difficult time gaining support.

- Decision-Makers' Values. The value system of top decision-makers in the partnership affect the specification of planning objectives. In the Corps, annual budget guidance identifies the agencies' priorities for the year. Many planners will see no point in deviating from this guidance in setting planning objectives, and in so doing, they may miss the chance to solve other problems or to capitalize on opportunities.

- Iterative Process. Defining objectives is an iterative process. Though specifying objectives early in a study is essential in order for planning to proceed, the final set of objectives may not be available until rather late in the planning process. Objectives, like plans, may require clarification and refinement as additional information comes to light or when it becomes clear some objectives cannot be addressed by the study.

really matter. What does matter is that you get the problems and opportunities identified and described.

Once the public and your technical experts have become involved in the problem identification process, the time has come to compare, verify and reconcile what you've heard about problems and opportunities. This may be the first truly difficult task in planning, but the difficulty is often more in perception than reality. Some basic questions can be used to guide this task.

***“Is that so?”...
“Who cares?”***

On the one hand, the technical experts should examine the problems and opportunities identified by the public, and ask “Is that so? What evidence do we have that supports or refutes these concerns?” For example, what damages resulted from the last flood? Or, how many ships have grounded in the channel? Have fish populations actually declined over the last 10 years? Similarly, the public should have an opportunity to review problems and opportunities identified by the experts to determine “Who cares?” While there may be scientific evidence of a problem condition, it may not be important enough to the public to warrant further attention.

Examples of Technical Problem Definition

The Corps knows exactly how to technically “define a problem” for flood control and navigation. They know who has to do what and in what order. Defining other problems is not as straightforward. The point, however, is that there is a set of technical tasks that have to be performed by a group of people in order to define the parameters of any problem the public might surface. Following are some sample tasks required to define a few selected problems:

Flood Damage Reduction

floods of record - hydrologist
cross-sections - survey engineer
discharges - hydraulic engineer
property inventory - economist, real estate specialist

“ANSWER” = damages for selected events

Commercial Navigation

bathymetry - surveyor
sedimentation studies - coastal engineer
channel geometry - design engineer
disposal area - design engineers and environmentalists
commodity and fleet forecasts - economist
“ANSWER” = costs of moving

commodities

on commercial vessels

Ecosystem Restoration

habitat suitability index models - environmentalist
hydrology - hydrologist
“ANSWER” = environmental outputs

At this point you're ready to write statements of problems and opportunities. *Problems and opportunities that pass both the "Is that so?" and "Who cares?" tests are good candidates for your planning objectives.* The information you developed from contacts with the public and technical experts should be presented, and summarized in a brief statement, preferably a simple declarative sentence.

If you look, and not even very hard, you will probably find an abundance of problems and opportunities in your study area. The Corps cannot hope to solve them all, and, indeed, is neither expected nor authorized to. The business of sorting out which problems and opportunities your study will address and which it won't, is in some respects very straightforward. There are many criteria that can give you a sense of whether or not, or to what extent, the Corps will be likely to study and implement a solution for a problem or opportunity. Some of them include the following:

- Is there a "Federal interest" in the situation?
- Does the language of the study authority cover the situation?
- Is the situation related to a Corps "mission"?
- Are traditional project purposes involved?
- Is the situation related to current "priority budget outputs"?
- Is the situation within the scope of the Federal objective?
- Can the outcomes be described in terms of NED benefit categories?
- Does the situation involve significant environmental resources?
- Is the situation covered by other Administration policies related to the Corps' program?

These are not pass-fail criteria. There is much room for interpretation in arriving at answers. The questions may lead to different answers at different times and among different studies. Answers may even depend on whom you ask. However, these questions are effective screens for focusing limited Corps resources on specific problems and opportunities.

The more questions you answer with "no," the more you will have to work to make the case for addressing a particular problem or opportunity. You may need more information to be convincing. Or you may have to do an excellent job of telling the story of a problem or opportunity. At the very least, you should recognize that policy criteria will arise on the road that leads to your objectives. Good problem definition will address these questions as a routine part of the job.

What is to be done about problems and opportunities that exceed the current policies and authorities of the partners, especially the Corps? High crime rates near the river, for example, may be a significant issue, but it's unlikely this problem can be addressed by the Corps. When another entity has an established responsibility for the problem identified, it may be possible to involve them in the study process. For example, although crime is well beyond the authority of the Corps' programs, it may be possible to solicit police and other public safety agencies' input in the design of floodwalls to assure that access through the wall, visibility of pedestrians, and minimization of potential hiding places are considered in project design.

Federal Interest

What is in the “Federal interest”? Although there is no single, enduring answer to that question, you can get some idea of the breadth and depth of the “Federal interest” from the following:

- *Catalog of Federal Domestic Assistance*. Superintendent of Documents, Government Printing Office. Library of Congress No. 73-600118 (revised quarterly). The Catalog lists all Federal programs, including the Corps' programs. A recent catalog included over 1300 listings.
- *National Environmental Policy Act (NEPA) Implementation Procedures; Appendices I, II and III; Final Rule*. Council on Environmental Quality. 40 CFR Chapter V (Federal Register, Friday, December 21, 1984, pages 49750-49782). Appendix II includes a listing of Federal and Federal-State agencies with jurisdiction by law or special expertise on environmental quality issues, including the Corps.

In other cases, information about problems or opportunities may be passed on to the appropriate authorities. Suppose, for example, a traffic flow problem is identified during this stage of the study. Even if it is beyond the scope of the water resource study, this information can be passed along to the appropriate agency for attention, rather than be ignored because it is beyond the Corps' authority.

In some instances, problems may be water-related but beyond the current Corps' authorities and policies. There are two schools of thought on this. One is to decline involvement in any activities that are beyond the Corps' authority. The other is to look for a way to blend these water resources needs into existing authorities, perhaps stretching and extending them a little. Acid mine drainage is an example of a problem over which the Corps has no current authority. New environmental programs and a renewed interest in watershed planning have provided the impetus for at least one district to address this problem. One aspect of watershed planning is to identify issues like these that might require a broader partnership. Bringing other Federal, State, and local agencies with an interest in these “new” issues into the partnership can be an effective way to develop more comprehensive plans.

If the public believes there is a problem or opportunity and the technical experts agree, or vice versa, and the situation seems to fall within the bounds of current policies, you can write your study's planning objectives and constraints. The results become your mission statement. Agreement with and general support of this mission statement by all of your study stakeholders is critical to the study's success.

Planning Objectives and Constraints

In this example, adapted from a Corps study, the objectives and constraints are directly associated with a problem or opportunity statement. The report text that follows a statement like this can then expand on each objective or constraint as necessary.

- Problem 1: Declining extent of wetlands ecosystem.
- Objective 1: Increase the total spatial extent of wetlands.
- Objective 2: Reestablish relative balance among lost historic plant, fish, and wildlife communities.
- Constraint 1: Protect threatened and endangered species.

- Problem 2: Continuing flood damages.
- Objective 3: Reduce flood damages on tribal lands.
- Constraint 2: No loss of flood protection from existing flood damage reduction projects.

- Opportunity 1: Improve water supply.
- Objective 4: Restore more natural water quality.
- Constraint 3: Meet state water quality standards.

Are you done? Yes, for a while, but keep in mind that the process is iterative. Objectives and constraints will change or even drop out and new ones may arise as

planning progresses. The steps to identify planning objectives are presented sequentially because an orderly approach to the discussion is needed. The actual identification of planning objectives is not so orderly. The study team may begin specifying objectives when they first see the study area. We want the planning professionals to have ideas and reactions from day one. We don't want those ideas to become crystallized and finalized, however, until all the work is done.

Nonetheless, the team will begin with some very preliminary notions of planning objectives. As problem identification proceeds these objectives will change. When public feedback about problems and opportunities is sought, more refinement and clarification will follow. As technical analysis begins to give dimension to the problems, more specific objectives can be fashioned. As the study

Multi-Objective Planning

Multi-objective planning is a confusing term. It has been used to mean both multiple Federal objectives and multiple planning objectives.

The Principles and Guidelines officially commit the Nation's water resource agencies to a single Federal objective, national economic development subject to certain environmental constraints. *When people talk about multi-objective planning, they are usually referring to the past practice of planning for more than one Federal objective.* Federal policy is currently single objective in nature.

progresses through the various iterations of the steps of the planning process, further refinements may be necessary. If your notion of specifying planning objectives is a team meeting where the doors are closed and the objectives are set once and for all, dispel that notion. That exercise may be a very useful starting point, but *specifying objectives is an iterative and participatory process*.

Early in the planning study, objectives may be very general in nature. As planning progresses and becomes more refined, the objectives should be continuously reexamined so that a limited number of very specific objectives are identified and used to develop alternative plans.

WHAT DO YOU DO WITH OBJECTIVES?

Use them. Use them to let people know what your study is all about.

In step 2, use them as guides to the information you gather. Collect information that will enable you to convincingly tell the story behind your objectives and constraints.

In step 3, use them as reasons for identifying management measures and formulating plans. What can you do to meet the objectives and avoid the constraints?

In step 4, use your objectives and constraints to identify plan effects to be evaluated. They can help you identify the plans that qualify for further consideration.

In step 5, use them to compare the relative effectiveness of your qualifying plans. How well do the various plans do in meeting the objectives and avoiding the constraints?

In step 6, use the objectives and constraints as reasons for selecting a plan. All other things equal, the recommended plan should be the one that best satisfies your objectives and constraints.

SUMMARY AND LOOK FORWARD

Lesson One. The study begins with an identification of an area's problems and opportunities. The partners, their customers and publics provide the information needed to develop a consensus agreement on the problems and opportunities to be considered in a study.

Lesson Two. Planning objectives and constraints may be a whole lot more important than you ever imagined. The objectives specify what the planning team and its plans intend to do. Constraints describe what the plans shouldn't do. Together, they are, in a sense, the mission statement of the partnership. If you get the planning

Multi-Purpose Planning

The purpose of a plan may be thought of as its primary output.

Traditional purposes of Corps projects include: flood damage reduction, navigation, hydroelectric power, municipal and industrial water supply, agricultural water supply, recreation, hurricane and storm damage protection, aquatic plant control, water quality improvement, fish and wildlife mitigation and enhancement. Water resource plans may be **single-purpose** or **multi-purpose**. A single-purpose plan serves one of these purposes; a multi-purpose project serves two or more of these purposes. In recent years, multi-purpose projects have tended to be primarily for one purpose with some ancillary inclusion of other purposes. There is nothing in the Principles and Guidelines that precludes multi-purpose planning.

Planners are often faced with a dilemma. On the one hand, authorizations and the Principles and Guidelines challenge them to develop plans that fully address a community's problems and needs. On the other hand, Administration policy tells them some problems and opportunities may not be considered a priority in the budget request. When walking through such political ground, planners must tread with sensitivity. *The sum total of the current situation is that planners are limited in what they can do but there is some flexibility.* True comprehensive multi-purpose planning is not currently practical, but some multi-purpose planning is possible. The Corps' currently evolving program for watershed planning and management is an avenue for multi-purpose problem solving. Perhaps the best practice is for planners to be positive and capitalize on what policy and circumstance permit.

objectives wrong, the formulation, evaluation and selection will be wrong. The choice of planning objectives determines to a significant degree the success of a planning study.

Lesson Three. Planning objectives are used in every step of the planning process.

The next chapter describes the second step of the planning process, the inventory of resources and the without-project condition description. This step establishes a benchmark for comparison of all alternative plan effects.

SUGGESTIONS FOR FURTHER READING

There is relatively little to read about the individual steps in the literature. That is one of the primary reasons for this manual. Generally speaking, the water resource planning references in Chapter Two and others like them are going to be the best sources of additional discussion on these subjects. The National Technical Information Service publications relating to the Principles and Standards listed in the References section of this report provide an additional source of material that may be of some limited interest.

Problem identification is a subject of many books in business management and it is a recurring theme in many planning texts. These books can provide refreshing insights from time-to-time, albeit from a different perspective.